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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,443	01/20/2004	Larry S. Eoff	2001-IP-005267UIP1	9208

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EXAMINER
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FIGUEROA, JOHN J

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,443	<b>Applicant(s)</b> EOFF ET AL.	
	<b>Examiner</b> John J. Figueroa	<b>Art Unit</b> 1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-186 is/are pending in the application.
- 4a) Of the above claim(s) 1-76 and 113-186 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 77-112 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |  |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. <u>20060315</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                                  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>8 IDS: 4/04-3/06</u> | 6) <input type="checkbox"/> Other: _____   |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-16, drawn to a method for treating a subterranean formation penetrated by a well bore to reduce its permeability to aqueous-based fluids comprising providing a permeability-modifying aqueous treatment fluid comprising a hydrophobically modified water-soluble polymer, classified in class 507, subclass 219+.
  - II. Claims 17-34, drawn to a method for treating a subterranean formation to reduce its permeability to aqueous-based fluids comprising providing a permeability-modifying aqueous treatment fluid comprising a hydrophobic compound, a hydrophilic polymer and a surfactant, classified in class 516, subclass 53+.
  - III. Claims 35-54, drawn to a method for fracturing a subterranean formation comprising injecting a permeability-modifying aqueous treatment fluid comprising a hydrophobically modified water-soluble polymer, classified in class 507, subclass 117+.
  - IV. Claims 55-76, drawn to a method for fracturing a subterranean formation comprising injecting a permeability-modifying aqueous treatment fluid

comprising a hydrophobic compound, a hydrophilic polymer and a surfactant, classified in class 516, subclass 53+.

- V. Claims 77-112, drawn to a method of acidizing a subterranean formation penetrated by a well bore comprising injecting a permeability-modifying aqueous treatment fluid comprising a hydrophobically modified water-soluble polymer, classified in class 507, subclass 219+.
- VI. Claims 113-132, drawn to a method of acidizing a subterranean formation penetrated by a well bore comprising injecting a permeability-modifying aqueous treatment fluid comprising a hydrophilic polymer, a hydrophobic compound and a surfactant, classified in class 516, subclass 53+.
- VII. Claims 133-157, drawn to a method of acidizing a subterranean formation penetrated by a well bore comprising injecting a permeability-modifying aqueous treatment fluid comprising a hydrophilic polymer and a hydrophilic compound, classified in class 507, subclass 110.
- VIII. Claims 158-171, a permeability-modifying aqueous treatment fluid comprising a hydrophobically modified water-soluble polymer, classified in class 507, subclass 209+.
- IX. Claims 172-186, a permeability-modifying aqueous treatment fluid comprising a hydrophobic compound, a hydrophilic polymer and a surfactant, classified in class 516, subclass 53+.

The inventions are distinct, each from the other because of the following reasons:

2. Invention VIII is related to inventions I, III, V and VII as product and process of uses. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h).

In the instant case, in addition to using the aqueous fluid containing the recited water-soluble polymer for modifying surface permeability in methods of fracturing/acidizing a subterranean formation, said aqueous fluid can instead be used as an aqueous viscosifying composition to provide, e.g., a fluid-loss additive in a method of completion/cementing a well bore.

3. Invention IX is related to inventions II, IV and VI as product and process of uses. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h).

In the instant case, in addition to using the aqueous fluid composition containing the recited water-soluble polymer and surfactant for modifying surface permeability in methods of fracturing/acidizing a subterranean formation, said aqueous fluid can instead be used as an aqueous viscosifying composition to provide, e.g., a fluid-loss additive in a method of completion/cementing a well bore.

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4. Inventions I is related to Invention II as methods of using a fluid containing a hydrophobically modified water-soluble polymeric compound for treating a well bore. The related inventions are distinct if the inventions as claimed do not overlap in scope, i.e., are mutually exclusive; the inventions as claimed are not obvious variants; and the inventions as claimed are either not capable of use together or can have a materially different design, mode of operation, function, or effect. See MPEP § 806.05(j).

In the instant case, each of the methods of use involves providing or injecting a composition containing a water-soluble polymeric compound. However, the composition recited in the claims in Group II further requires a surfactant. The composition in Groups II can thus be an emulsion, which is patently distinct from the composition claimed in Group I.

5. Inventions III and Invention IV are related as methods of using a fluid containing a hydrophobically modified water-soluble polymeric compound for fracturing a subterranean formation. In the instant case, each of the methods of use involves providing or injecting a composition containing a water-soluble polymeric compound. However, the composition recited in the claims in Group IV further requires a surfactant. The composition in Groups IV can thus be an emulsion, which is patently distinct from the composition claimed in Group III.

6. Inventions V and VI are both related to VII as directed to methods for acidizing a well bore. In the instant case, each of the methods of use involves injecting a composition containing a hydrophilically modified polymer. However, the composition recited in the claims of Group VI further requires a surfactant. The composition in

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Group VI can thus be an emulsion, which is patently distinct from the composition claimed in Groups V and VII.

7. Inventions V and VII are directed to related methods of acidizing a well bore. In the instant case, the methods of injecting a composition involve compositions having patentably distinct water-soluble polymers. In Group V, the water-soluble polymer is a *hydrophobically* modified copolymer, whereas in Groups VII, said polymer is instead a *hydrophilically*–modified copolymer.

8. Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, and further require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

9. During a telephone conversation with Mr. Robert A. Kent on March 9, 2006, a provisional election was made without traverse to prosecute the invention of Group V, claims 77-132. Affirmation of this election must be made by Applicant in replying to this Office action. Claims 1-76 and 133-186 are withdrawn from further consideration by the Examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

10. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Double Patenting***

11. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

12. Claims 77-132 are rejected on the ground of nonstatutory double patenting over claims 1-7 and 13-19 of U. S. Patent No. 6,476,179 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming



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common subject matter, as follows: the claims in both patents are drawn to a method of treating (e.g. acidizing) a subterranean formation to alter the permeability of the formation by introducing (e.g., injecting) a hydrophobically modified hydrophilic polymer as an RPM.

13. Claims 77-132 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-17 and 21-40 of copending Application No. 10/612,271. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of stimulating/acidizing a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

14. Claims 77-132 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-98 of copending Application No. 10/763,800. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant

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application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating (e.g. acidizing) a subterranean formation by providing (injecting) an RPM containing a hydrophobically modified water-soluble polymer.

Particularly, the method recited in the claims of the '800 application and that of claims 35-54 and 77-112 of the instant application recite *injecting* a fluid including a water-soluble polymer into the formation.

15. Claims 77-132 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-45 of copending Application No. 10/780,995. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating (e.g. acidizing) a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

16. Claims 77-132 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-55 of copending Application No. 10/806,894. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims encompass a method of treating a subterranean formation by providing (e.g., injecting) an RPM containing a hydrophobically modified water-soluble polymer.

17. Claims 77-132 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-24 of copending Application No. 10/825,001. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: both sets of claims are drawn to a method of treating (e.g. acidizing) a subterranean formation comprising introducing (e.g. injecting) a RPM containing a hydrophobically modified water-soluble polymer.

#### ***Information Disclosure Statement***

18. The information disclosure statement filed January 23, 2004, April 15, 2005 and June 6, 2005 listed documents from that were cited in another IDS filed with this application. The documents that were cited elsewhere in other submitted IDS have

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been crossed out on the corresponding PTO-1449 form. Moreover, the IDS filed on July 11, 2005 listed the instant application (10/760,443) on the corresponding PTO-1449 form. It was, of course, also crossed out.

***Claim Rejections - 35 USC § 102***

19. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

20. Claims 77-86, 88-100 and 102-112 are rejected under 35 U.S.C. 103(a) as being anticipated by United States Patent Number (USPN) 4,532,052 to Weaver et al. (hereinafter 'Weaver').

Weaver discloses a method for fracturing or acidizing a subterranean formation to substantially alter the fluid flow (permeability) and/or surface characteristics of the formation, said method including injecting into the formation an aqueous composition that can alter the properties of organic/aqueous fluids, said composition containing a branched water-soluble organic polymer containing unit(s), having a molecular weight of 900 to 50,000,000, that can be hydrophilic, hydrophobic or a combination thereof, and can further include a gelling agent and/or a proppant. (Abstract; col. 5, lines 1-10 and 30-65; col. 6, lines 29-65; col. 7, lines 7-33; col. 9, lines 32-37 and 49-63; col. 20, line 65 to col. 21, line 6; col. 21, lines 49-63; col. 38, lines 37-51; col. 39, lines 24-36; See also,

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Table 6 on col. 53-54 disclosing data of aqueous fluid diverting and water permeability reduction properties for an aqueous fluid containing a methoxypolyethylene oxide branched polydimethylaminoethyl methacrylate copolymer, sand, silica flour and bentonite)

For example, an exemplary polymer disclosed in Weaver for treating subterranean oil producing formations has a cationic hydrophilic backbone modified with hydrophobic branches providing a desired hydrophobic-hydrophilic within the formation, thus altering the surface characteristic of the formation and the fluid flow or resistance to flow relative to a particular fluid, wherein the hydrophilic nature of the branched polymer serves as an aqueous gelling agent that provides for an increase in fluid viscosity. (Col. 5, lines 11-16; col. 6, line 65 to col. 7, line 40; col. 7, line 63 to col. 8, line 21; col. 10, lines 56-59; Table on col. 9-10) In Tables 23-28, Weaver discloses data for examples of treating a well by injecting into the well an aqueous solution containing a cationic polymer with nonionic branches.

The water-soluble branched polymer can have, in its backbone chain and/or in its branch chain, one or more heteroatom or groups, such as nitrogen, oxygen, phosphorous, sulfur, sulfur groups, amide, carboxyamide and carbonyl. (Col. 14, lines 17-23 and 52-59) The polymer units in either chain can be  $-R-X-$ , wherein R is a  $C_1$  to  $C_6$  alkyl radical and X represents a heteroatom and are preferably capped. (Col. 19, lines 36-65) Particularly, branched polymers containing polyamine and polyether linkages in the branches are preferred for altering fluid flow properties in the formation

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and are especially effective and stable at temperatures above 177°C. (Col. 13, lines 1-18)

Among the monomers disclosed in Weaver that can be used to form the branched polymer include dimethylaminoethyl methacrylate, acrylic esters, acrylamide, epichlorohydrin and chloroprene; wherein the polymeric unit/group can be derived from, e.g., saccharide or a derivative thereof (including cellulose and starch), vinyl, diallylic, amide or ether monomeric units, as long as it has the desired hydrophilic-hydrophobic property. (Col. 19, lines 7-10; col. 19, line 66 to col. 20, line 29; col. 22, lines 47-65) The vinyl or diene polymer units are represented by (Class I, structure on col. 23); the amine type polymer units (Class III, structure on col. 24-25); the amide type polymer units (Class IV, structure on col. 25); whereas the saccharide and saccharide derivative units (Class V) are represented by the chemical structure depicted on col. 25-26, lines 43-59. (See also, the examples of class V on col. 35-36)

Weaver further discloses that a preferred class of polymers for altering aqueous fluid properties, such as altering water-oil ratio in a formation process and enhancing oil production, are polymers containing 2-hydroxylpropyl N,N dialkyl-amine as backbone units and acrylamide (organic acid derivative) and/or epichlorohydrin reacted polyalkoxide as the branch units. (Col. 42, lines 31-37) In Procedure O beginning on col. 50, line 5, Weaver discloses an example of altering the permeability of a formation surface (change in water-oil ratio) by injecting into the formation a copolymer of polydimethylaminoethyl methacrylate (PDMAEM having MW of 1 million) grafted with a polyethylene oxide branch (PEO, MW of 15,000). The resulting data showing reduction

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in water permeability of the formation is shown in Tables 7 and 8. (See *also* Tables 10-13 on col. 57-59 for permeability data of an aqueous treating solution containing 1% of a hydrophilic PDMAEM polymer (MW of 600-800K) branched with a hydrophobic methoxy-polyethylene glycol epichlorohydrin (MPEO) adduct; particularly, polymer #7 of Table 10). In Tables 14-15 on col. 59, Weaver further discloses PDMAEM:PEO/MPEO weight ratios for the branched polymer ranging from 0.5:1.0 to 1.25 to 0.25.

Thus, the claims are anticipated by Weaver.

### ***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 83, 86-88, 89, 96-98 and 100-101 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver in view of USPN 6,358,889 B2 to Waggenpack et al (hereinafter 'Waggenpack').

Weaver was discussed above. Weaver discloses the hydrophobic branch attached to the backbone of the hydrophilic polymer to contain an ester or amide. However Weaver does not specifically disclose the hydrophobic branch to be a succinic acid derivative.

On the other hand, Waggenpack teaches well drilling and servicing fluids that include an aqueous fluid containing a hydrophobically modified chitosan polymer (a glucosamine polysaccharide derivative), wherein said modified chitosan polymer is formed from the in-situ reaction of a chitosan polymer with an anhydride modifying compound, such as succinic anhydride, dodecynylsuccinic anhydride or any other alkenyl succinic anhydride having a  $C_2$  to  $C_{20}$  alkenyl chain. (Abstract; col. 3, line 65 to col. 4, line 6; col. 5, lines 33-65; col. 14, lines 48-67; Example 1)

Waggenpack further teaches that adding the modified chitosan water-soluble polymer increases the viscosity of the aqueous fracturing/servicing fluid, thus providing the fluid with enhanced low shear rate viscosity that is shear thinning. (Col. 1, lines 15-22 and 36-57; col. 3, lines 13-21)

Therefore, it would have been obvious to a person of ordinary skill in the art at the time that the invention was made to use the modified chitosan copolymer taught in Waggenpack as the hydrophobically modified hydrophilic polymer injected in Weaver's method of acidizing a subterranean formation. It would have been obvious for one skilled in the art to do so to attain a more cost-effective method of acidizing by using a more viscous aqueous fluid having superior shear properties as taught by Waggenpack, and thus efficiently attain a desired level of surface permeability of the subterranean formation.

Thus, the claims are unpatentable over Weaver and Waggenpack.



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**Conclusion**

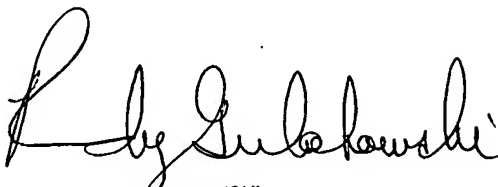
23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John J. Figueroa whose telephone number is (571) 272-8916. The examiner can normally be reached on Mon-Thurs & alt. Fri 8:00-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JJF/RAG

  
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